

I n s i d e		April 23, 2004	
		Volume 34 Number 8	
News Briefs		2	Visualizing Mars
Special Events Calendar		2	Passings, Letters
Division 35 Salutes MER		2	Classifieds
			4

Meteorite-like rock found on Mars

By Guy Webster



This false-color composite of “Bounce Rock” shows the rock after the Spirit rover drilled into it with its rock abrasion tool. The drilling of the 0.3-inch hole generated a bright powder.

JPL’s Opportunity rover has examined an odd volcanic rock on the plains of Mars’ Meridiani Planum region with a composition unlike anything seen on Mars before, but scientists have found similarities to meteorites that fell to Earth. “We think we have a rock similar to something found on Earth,” said Dr. Benton Clark of Lockheed Martin Space Systems, Denver, science-team member for the Opportunity and Spirit rovers. The similarity seen in data from Opportunity’s alpha particle X-ray spectrometer “gives us a way of understanding ‘Bounce Rock’ better,” he said. Bounce Rock is the name given to the odd, football-sized rock because Opportunity struck it while bouncing to a stop inside protective airbags on landing day.

The resemblance helps resolve a paradox about the meteorites, too. Bubbles of gas trapped in them match the recipe of martian atmosphere so closely that scientists have been confident for years that these rocks originated from Mars. But examination of rocks on Mars with orbiters and surface missions had never found anything like them, until now. “There is a striking similarity in spectra,” said Christian Schroeder, a rover science-team collaborator from the University of Mainz, Germany, which supplied both Mars rovers’ Moessbauer spectrometer instruments for identifying iron-bearing minerals.

Mars Exploration Rover scientists described two such meteorites in particular during a JPL news conference. One rock, named Shergotty, was found in India in 1865 and it gave its name to a class of meteorites called shergottites. A shergottite named EETA79001 was found in Antarctica in 1979 and has an elemental composition even closer to Bounce Rock’s. Those two and nearly 30 other meteorites found on Earth are believed to have been ejected from Mars by the impacts of large asteroids or comets hitting Mars.

Opportunity’s miniature thermal emission spectrometer indicates that the main ingredient in Bounce Rock is a volcanic mineral called pyroxene, said science-team collaborator Deanne Rogers of Arizona State University. The Moessbauer spectrometer also identified pyroxene in the rock. The high proportion of pyroxene makes it unlike not only any other rock studied by Opportunity or Spirit, but also unlike the volcanic deposits mapped extensively around Mars by a similar spectrometer on the JPL-managed Mars Global Surveyor orbiter, Rogers said.

Thermal infrared imaging by another orbiter, Mars Odyssey, suggests a possible origin for Bounce Rock. An impact crater about 16 miles wide lies about 31 miles southwest of Opportunity. The images show that some rocks thrown outward by the impact that formed that crater flew as far as the distance to the rover. “Some of us think Bounce Rock could have been ejected from this crater,” Rogers said.

Opportunity is driving eastward, toward a crater dubbed “Endurance” that might offer access to thicker exposures of bedrock than the rover has been able to examine so far. With new software to improve mobility performance, the rover may reach Endurance within two weeks, said JPL’s Jan Chodas, flight software manager for both Mars Exploration Rovers.

Mission controllers at JPL successfully sent new versions of flight software to both rovers. Spirit switched to the new version successfully on April 12, and Opportunity did the next day.

A parting look at the small crater in which Opportunity landed is part of a full 360-degree color panorama released at the news conference. The view combines about 600 individual frames from the rover’s panoramic camera, said science-team collaborator Jason Soderblom of Cornell University. It is called the Lion King panorama because it was taken from a high-ground viewpoint at the edge of the crater, like the high-ground viewpoint used by animal characters in the Lion King story.

Invisible gas giants exposed by Spitzer

By Whitney Clavin

Hidden behind a curtain of dusty darkness lurks one of the most violent pockets of star birth in our galaxy. Called DR21, this stellar nursery is so draped in cosmic dust that it appears invisible to the human eye.

By seeing in the infrared, the JPL-managed Spitzer Space Telescope has pulled this veil aside, revealing a fireworks-like display of massive stars, the biggest of which is estimated to be 100,000 times as bright as our own Sun.

“We’ve never seen anything like this before,” said Dr. William Reach, an investigator for the latest observations and an astronomer at the Spitzer Science Center at Caltech. “The massive stars are ripping the cloud of gas and dust around them to shreds.”

Located about 10,000 light-years away in the Cygnus constellation of our Milky Way galaxy, DR21 is a turbulent nest of giant newborn stars. The region is buried in so much space dust that no visible light escapes it. Previous images taken with radio and near-infrared bands of light reveal a powerful jet emanating from a huge, nebulous cloud. But these views are just the tip of the iceberg.

Spitzer’s highly sensitive infrared detectors were able to see past the obscuring dust to the stars behind. The new false-color image spans a vast expanse of space, with DR21 at the top center. Within DR21, a dense knot of massive stars can be seen surrounded by a wispy cloud of gas and dust. Red filaments containing organic compounds called polycyclic aromatic hydrocarbons stretch horizontally and vertically across this cloud. A green jet of gas shoots downward past the bulge of stars and represents fast-moving, hot gas being ejected from the region’s biggest star.

Below DR21 are distinct pockets of star formation, never captured in full detail before.

The new view testifies to the ability of massive newborn stars to destroy the cloud that blankets them. Astronomers plan to use these observations to determine precisely how such an energetic event occurs.

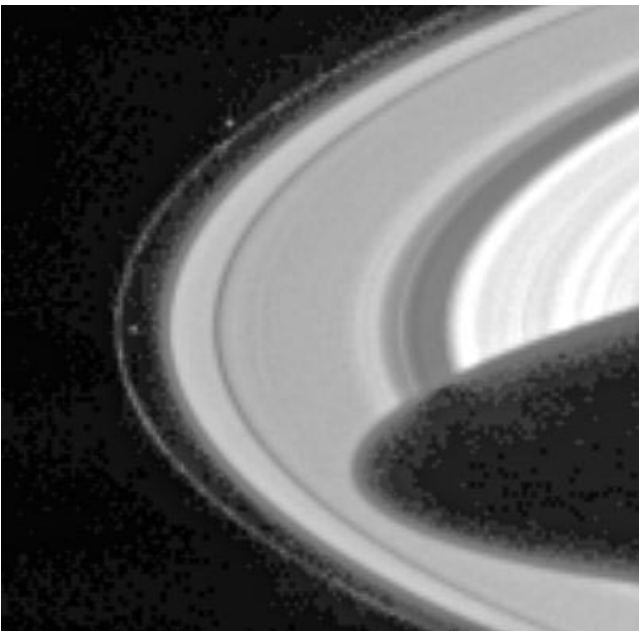
The new image is available online at <http://photojournal.jpl.nasa.gov>.

Spitzer, which was launched in August 2003, is managed by JPL for NASA’s Office of Space Science.

Cassini finds moons in the rings

Cassini has sighted Prometheus and Pandora, Saturn’s two F-ring-shepherding moons whose unpredictable orbits both fascinate scientists and wreak havoc on the F ring.

Prometheus (63 miles across) is visible left of center in the image, inside the F ring. Pandora (52 miles across) appears above center, outside the ring. The dark shadow cast by the planet stretches more than halfway across the A ring, the outermost main ring. The mottled pattern appearing in the dark regions of the image is “noise” in the signal recorded by the camera system, which has subsequently been magnified by the image processing.



News Briefs



Earth and Space Foundation co-founder Douglas Messier, left, presents award to MER Flight Director Chris Lewicki.

MER honored by foundation

The Earth and Space Foundation has presented its first Exploration Award to the JPL Mars Exploration Rover (MER) team for its outstanding work on the surface of the Red Planet this year. Foundation co-founder DOUGLAS MESSIER presented the award to MER Flight Director CHRIS LEWICKI and team member JULIE TOWNSEND, on behalf of the team, during the April 12 Los Angeles celebration of Yuri's Night: The Global Space Party, held at Los Angeles International Airport. "The MER team has done extraordinary work on the surface of Mars during these past three months," Messier said. "I can't think of a better recipient for this award than this outstanding group."

The Earth and Space Foundation was established in 1994 as a non-profit organization in the United States and the United Kingdom. The foundation has supported more than 40 expeditions in two categories: the use of space technologies to help study and preserve the Earth's fragile biosphere; and the study of life in our planet's most extreme environments. Yuri's Night is held each year on April 12 to mark the first human spaceflight by Yuri Gagarin in 1961 and the first shuttle mission 20 years later. This year, 75 parties were held on seven continents. "We're very pleased to be doing this presentation at Yuri's Night," Messier said. "The purpose of this celebration is to get the world's youth excited about space exploration. Spirit and Opportunity certainly achieved that goal."

Four receive Ed Stone Award

Four JPL employees have received the 2004 Dr. Edward Stone Award for Outstanding Research Publication. The annual awards recognize and encourage publication of significant research results in science and technology by JPL employees throughout their professional careers. The recipients are: STEVEN CHESLEY, senior engineer, Organization 3120. Publication: "Direct Detection of the Yarkovsky Effect via Radar Ranging to Near-Earth Asteroid 6489 Golevka."

PETER DAY, senior engineer, Organization 3869. Publication: "A Broad-band Superconducting Detector Suitable for Use in Large Arrays." IAN JOUGHIN, senior engineer, Organization 334. Publication: "Changes in West Antarctic Ice Stream Velocities: Observation and Analysis." CHRISTOPHER WEBSTER, senior research scientist, Organization 324. Publication: "Water Isotope Ratios D/H, 180/160, 170/160 In and Out of Clouds Map Dehydration Pathways."

Each winner received a certificate of recognition and a Level A Bonus Award. In return, each recipient is asked to give a public lecture to the JPL community related to the work for which he is being recognized. The lectures will be spread through the year. The award was established in 2000 in honor of Stone, who served as JPL's Director from 1991-2001.

Lab hosts Quality Assurance event

JPL's Procurement Quality Assurance Group last month hosted the semi-annual Quality Leadership Forum Conference, held in Cocoa Beach, Fla. More than 150 Quality professionals from NASA and the aerospace industry attended. Procurement Quality Assur-

ance Group Supervisor BUCK CRENSHAW hosted the event, which addressed issues such as leadership, metrics, tools, process control and lessons learned. Also in attendance was Quality Assurance Section Manager CARL DE SILVEIRA. TOM RAMSEY, JPL's quality assurance manager for the Mars Exploration Rovers, spoke on the role of quality assurance in MER's success. JPL's supplier outreach coordinator KIEN NGUYEN spoke on the Supplier Outreach Process Control program, a JPL-administered NASA Code Q-sponsored initiative to reach out to suppliers and sub-tier suppliers of Earth science, space science, and biological and physical research programs. OLGA CERITELLI, JPL's procurement quality assurance supplier interface lead, presented on the Supplier Rating System currently in development. This system will include components of the Department of Defense's Naval Sea Logistical Center's Product Data Reporting Evaluation Program.

For information on this or upcoming Quality Leadership Forum conferences, call Crenshaw (ext. 4-7225) or Ceritelli (3-6085) or join the online workgroup at <http://qualityleadership-pbma-kms.intranets.com>. In conjunction with the Quality Leadership Conference, Ramsey participated in a panel discussion on the fundamentals of quality contributing to program success/interaction of quality in the entire life cycle at the Conference on Quality in the Space and Defense Industries, held in Cape Canaveral, Fla., March 22 and 23. Procurement Quality Assurance also hosted "Strengthening Ties with Your Supplier Base," a workshop in which panelists from JPL, ATK Thiokol and Adacel Inc. shared ways in which their respective companies manage, recognize and work with their supplier base. For CQSDI Conference information, visit www.asdnet.org/cqsd.

Revlon Run/Walk for Women May 8

The Director's Advisory Council for Women notes JPL's participation in the 11th annual Revlon Run/Walk for Women on Saturday, May 8. The event raises vital funds for research into the cause and cure of women's cancers as well as funds to provide support for patients surviving these diseases. To date, the Run/Walk has raised \$28 million. This is the fourth straight year JPL will participate. To join the team, register at <https://www.revlonrunwalk.com/la/secure/findteam.cfm>. JPL's team number is 588. This year's goal is to have 75 participants raise \$7,500. If you are unable to attend, you can still join the fight by sponsoring registered team members on the website. If you have any questions or comments, contact NANCY NEILAN at ext. 4-1809 or by e-mail.

Earth science conference signups

NASA's Earth Science Technology Office is presenting the fourth annual Earth Science Technology Conference in Palo Alto, Calif., June 22-24. The conference will showcase a wide array of technology research related to NASA Earth science efforts. Attendees will encounter new developments in information systems, computing, instruments and component technologies, and will learn about the vision and future needs for Earth science technology. For more information and to register, log on to <http://esto.nasa.gov/conferences/estc2004>.

Survey rates NASA a top workplace

The Partnership for Public Service and the American University Institute for the Study of Public Policy Implementation has released the second set of rankings of the "Best Places to Work in the Federal Government." Young people, women and minorities selected NASA as the best place to work in the federal government. The rankings were compiled from an employee satisfaction survey administered to more than 100,000 federal employees by the U.S. Office of Personnel Management. To view the rankings, visit <http://www.bestplacetowork.org>.

Special Events Calendar

Ongoing Support Groups

Alcoholics Anonymous—Meetings are available. Call the Employee Assistance Program at ext. 4-3680 for time and location. Caregivers Support Group—Meets the first Thursday of the month at noon in Building 167-111 (the Wellness Place). For more information, call the Employee Assistance Program at ext. 4-3680. Codependents Anonymous—Meeting at noon every Wednesday. Call Occupational Health Services at ext. 4-3319. Gay, Lesbian and Bisexual Group—Meets the first Friday and third Thursday of the month at noon in Building 111-117. Call the Employee Assistance Program at ext. 4-3680 or Randy Herrera at ext. 3-0664. Parents Group for Children With Special Needs—Meets the second Thursday of the month at noon in Building 167-111 (the Wellness Place).

Working Parents Support Group—Meets the third Thursday of the month at noon in Building 167-111. For more information, call the Employee Assistance Program at ext. 4-3680.

Friday, April 23

"The Flow of Energy Through the Earth's Climate System"—Dr. Kevin Trenberth, who leads the Climate Analysis Section at the National Center for Atmospheric Research, will speak at 11:30 a.m. in von Kármán Auditorium. The talk is sponsored by the Office of the Chief Scientist and the Earth and Space Sciences Division.



Saturday, April 24

Caltech Jazz Bands—The Caltech Jazz Festival, featuring "Jazz Classics for Big Band," will be presented from 2 to 6 p.m. at Gates Library Patio, near Dabney Lounge. Free admission. For more information, call (626) 395-4652. Folk Music—Autoharp player/traditional singer/storyteller Bryan Bowers will appear at 8 p.m. in Caltech's Beckman Institute Auditorium. Tickets are \$15 for adults, \$5 for children under 12. For more information, call (626) 395-4652 or check the Folk Music Society website at <http://www.folkmusic.caltech.edu>.

Sunday, April 25

Chamber Music—The Coleman Chamber Ensemble Competition Winners Concert will be presented at 3:30 p.m. in Caltech's Ramo Auditorium. Tickets are \$15 for adults, \$10 for high school age and under. For more information, call (626) 395-4652.

Wednesday, April 28

"Challenges and Excitement of Space Exploration"—JPL Director Dr. Charles Elachi will deliver this free lecture at 8 p.m. in Caltech's Beckman Auditorium. For more information, call (626) 395-4652. JPL Toastmasters Club—Meeting at 5 p.m. in the 167 conference room. Call Debbi Llata at ext. 3-3690 for information. Volunteer Professionals for Medical Advancement—Meeting at 10:30 a.m. at the Caltech Credit Union, 528 Foothill Blvd., La Cañada.

Thursday, April 29

JPL Golf Club—Meeting at noon in Building 306-302. JPL Stories—Tom Farr of the Earth and Space Sciences Division will present "Feet on the Ground, Eyes in the Sky: A Field Geologist's Adventures in Remote Sensing" at 4 p.m. in the Library, Building 111-104. If you have questions about the story series or wish to participate, call Teresa Bailey at ext. 4-9233.

Friday, April 30; Sat., May 1

Capitol Steps—This troupe of former Congressional staffers will perform song parodies poking fun at politicians and other newsmakers at 8 p.m. in Caltech's Beckman Auditorium. Tickets are \$32, \$28, and \$24; high school age and under, \$10. For more information, call (626) 395-4652.

Sunday, May 2

California String Quartet—This free concert will be offered at 2:30 p.m. in Caltech's Ramo Auditorium. For more information, call (626) 395-4652.

Tuesday, May 4

Caltech Management Association—A program to honor JPL's Mars Exploration Rover team will take place in Beckman Auditorium at noon. MER team members will take part in a panel discussion about their project experiences as well as respond to audience questions. The entire JPL and Caltech Campus community is invited. A box lunch will be provided to everyone who attends as they leave the event.

JPL Gamers Club—Meeting at noon in Building 301-227. JPL Genealogy Club—Meeting at noon in Building 301-271.

Thursday, May 6

Clogging Class—Meets at noon in Building 300-217. For more information, call Shary DeVore at ext. 4-1024. JPL Gun Club—Meeting at noon in Building 183-328.

Division 35 salutes MER



Dutch Slager / JPL Photolab

Division 35 Manager Phil Garrison, left, and Mars Exploration Program Manager Dr. Firouz Naderi chat at April 9 celebration of the division honoring its members who contributed to the success of the mission. About 350 MER team members from Division 35 received certificates of recognition.

By Susan Braunhelm-Kalogerakos



JPL's Informal Education Office and the Mars Public Engagement Office are partnering with museums, science centers, planetaria and other non-profit informal science education organizations across the country in an effort bring Mars to Earth. The Mars Museum Visualization Alliance is a collaboration between JPL and more than 100 institutions to share the adventure of exploration and make Mars a real place.

JPL provides the alliance partners with assured access to the real-time and press-released images, timely information, people and an "in" to NASA. The alliance members use the images and information in their live programming, webcasts, exhibits, presentations, classes and educational activities.

The idea for such an alliance was spawned a few months after Mars Pathfinder's July 4, 1997, landing when Anita Sohus, JPL's informal education lead, was visiting a curator at the National Air and Space Museum in Washington, D.C., the world's most visited museum. "He observed that on the day of Pathfinder's landing, he had a huge auditorium full of excited people—and nothing to show them," Sohus said. "What a lost opportunity."

"I learned that museums, science centers and planetaria have unique facilities, knowledgeable and enthusiastic staff, and strong ties within their local communities, including the school systems and civic leaders," she added.

Sohus took this information and went to work with Michelle Viotti, Mars public engagement manager, and Eric De Jong, principal investigator for the Solar System Visualization Project, to create the Mars Museum Visualization Alliance.

A key to the success of the program has been the near-real-time release of images. "We created the alliance to assure that these institutions would have access to the visuals and information they could present to their audiences in a timely way," Sohus said. "They get the images at the same time as the science teams." This service has never been provided in past outreach campaigns.

The alliance members receive e-mail notifications about the latest NASA TV schedule, breaking news, opportunities and contacts, and participate in regular teleconferences that allow them to ask questions, share information and interview Mars Exploration Rover team members. Member institutions can also advertise their events on the public NASA Mars Web page. More than 100 events have been advertised in this manner.

JPL provides the institutions with reality TV, up-to-the-minute images, reliable information and resources, and as a result, through these venues, tens of thousands of people nationwide are exploring Mars right along with us. Solar System Ambassador Michelle Nichols at Chicago's Adler Planetarium noted, "We've got the 3-D images playing in one of our galleries and it's just been wonderful. People walk out with these stunned looks on their faces like, 'Oh my God, I've been to Mars.'"

"Planetarians, especially, consider themselves 'NASA evangelists,'" Sohus added. "So we have a huge cadre of knowledgeable, dedicated and talented spokespeople in nearly all areas of the country, telling our story and making it relevant for their own audiences."

The images and information received via the alliance have enhanced the museums' ability to teach using current science and technology events. "The magic, for me, is putting the live stuff into our daily programming," said Jon Elvert, director of the Irene W. Pennington Planetarium in Baton Rouge, Louisiana, and president of the International Planetarium Society. "Then the planetarium truly becomes a learning center."

Added Dave Hurst, astronomy professor at Glendale Community College, "We're learning geology through an actual case study rather than linearly through a textbook."

"Each facility is able to do what they do best," Sohus noted. "They are ecstatic to get the images in near-real time to use in their daily programming and classes. They share resources and knowledge, and love the connectivity with NASA, JPL and each other."

"Their cache in their communities has risen due to the NASA/JPL connection, and as a result they are getting higher attendance and lots of local press—and so are we."

Rob Semper, executive associate director at the Exploratorium science museum in San Francisco, agrees. "JPL has done an amazing thing with this museum alliance. It has provided just the right inside track to let the museums do what they do best," he said.

The MER landings were big hits with museum crowds. Many facilities reported their auditoriums were filled to capacity and some had to turn people away. "We were getting a heavy snowstorm the night Spirit landed and had to make a judgment call as to how late to stay open. We decided to stay open very late," said Jim Todd, planetarium director at the Oregon Museum of Science and Industry in Portland. "We turned away about 200 to 300 people, and had to open our auditorium and the planetarium. We had so many people standing in the halls cheering; it was great."

The network will extend beyond the MER missions, including all of the upcoming Mars missions. In addition, De Jong noted that the Cassini mission has already signed up to use the alliance. "We will use the same process to send images of Saturn to the museums that we used on MER," he said.

"Other missions are definitely interested in taking advantage of this network," Sohus said, "and it makes perfect sense, since the infrastructure and connections already have been made."



"Museums, science centers and planetaria have unique facilities, knowledgeable and enthusiastic staff, and strong ties within their local communities, including the school systems and civic leaders."

*— Anita Sohus
JPL informal
education lead*

Sharing the vision

MER thermal systems engineer Shonte Wright shows an astronaut suit to Washington Middle School students.

NASA officials joined Mars Exploration Rover team members in visits to Southern California NASA Explorer Schools this month. Associate Administrator Dr. Victor Lebacqz joined MER thermal systems engineer Shonte Wright at Washington Middle School in Pasadena on April 14. The next day, Assistant Administrator David Saleeba and JPL senior robotics engineer Dr. Eddie Tunstel stopped by Ruth O. Harris Middle School in Bloomington (near Fontana); Saleeba also visited 153rd Street Elementary School in Gardena, accompanied by MER science manager Dr. John Callas. The NASA officials and the MER team members talked with students about our destiny as explorers, NASA's steppingstone approach to exploring Earth, the moon, Mars and beyond, how space impacts our lives, and how people and machines rely on each other in space. For information about NASA's Explorer Schools Program, visit <http://explorerschools.nasa.gov>.



Dutch Slager / JPL Photolab

Passings

DAVID QUINN, 75, a retired project resource administrator in Section 250, died April 3. Quinn worked at the Lab from 1971 to 2003. He is survived by his wife, Jean; sons David Jr., Peter and Gary; and three grandchildren. Services were held April 13 at All Saints Church in Pasadena.

DEET STOFFERS, 80, retired from Security after a 32-year career at the Lab, died April 8. Stoffers retired in 1991, working for 25 years as a receptionist at JPL visitor control. She is survived by her husband, Fred, son Steve, daughter Kay, three grandchildren and four great grandchildren. Memorial services were held April 17.

Letters

I would like to thank my friends, co-workers, Section 512 and the ST-7 team for your support during this very difficult time. Your thoughtfulness and expressions of condolence for me and my family is greatly appreciated in the recent passing of my loving father. Sincerely,

Donna Markley

On behalf the Armstrong family I would like to thank all my friends and colleagues in Section 381 and Raytheon, and the rest of JPL including JPL Hospitality for the condolences, cards, flowers and plants that we received upon the death of my father. My father, a former airline pilot who was naturally a technically savvy person, was very enthusiastic about the work we do here at JPL and always inquiring about our latest projects and endeavors. Many thanks for your support, which was greatly appreciated.

Ed Armstrong

On behalf of my family and myself I would like to thank my friends, co-workers and JPL for their kind words, flowers and the beautiful plant following the unexpected death of my father-in-law.

Cynthia Benavides-Baldwin

I would like to thank Section 368 and the rest of my JPL friends and co-workers for the expression of sympathy and support you gave me and my family upon the death of my father. Your kind thoughts, plant and the card are greatly appreciated.

Boris Shenker

Classifieds

For Sale

ANGEL TICKETS, 2 seats, \$30 for the pair, various games from season tickets, lower view MVP, just right of home plate. 626/354-2337, Brian (not a JPL extension). ANGEL TICKETS, pairs from 20-gm. pack, avail. for most games, \$9-\$11 ea. 626/844-9286. BABY ITEMS: crib, wood, made in Italy, includes mattress (height adjustable), exc. cond., photo available, \$150/obo; car seat, front-facing, up to 40 lbs, made by Century, good cond., \$25/obo. 626/791-6101. BED, frame, Cometa queen, cherry wood, Italian design, see at www.modfurniture.com/italian.html, paid \$1,300 new, sell \$800. 244-8822. BEDROOM SET, Ikea, queen, black, head-board has shelves, nightstands w/drawers, muck70@hotmail.com for pictures, \$75/obo. 760/948-6839. BLINDS, vertical, for sliding patio door, white, great cond., \$20. 323/342-9363. BREAST PUMP, brand new Medela Pump-In-Style, still sealed in the original box from manufacturer, \$199. 909/576-5789. BUNK BED, oak, twin on top, double on

bottom, 2 lg. drawers, exc. cond., bought for \$1,200, sell \$500. 909/599-9853. CD CHANGERS, 100, Aiwa; 200 Sony; 400 Sony. 790-7129, Bill. COMPUTER DESK, mobile, cherry veneer, O'Sullivan model 61925, exc. cond., like new; sell for best offer. 626/449-0997. DESK, from Plummers, teak veneer, side built-in bookshelf, 2 drawers, vg cond., 47" L, 28.5" H, 36" D, \$50. 626/644-1296. DESK, teak, lg. 69" x 39," contemporary, solid, attractive, 3 locking drawers, pick up on Green St., \$50, cash only. 957-3030 or 298-2044. DUFFEL BAG, Samsonite, Outline 5, brand new, dark green, top-quality 1680D ballistic nylon, carry-on size (19" x 12" x 12"), padded handles & shoulder strap, lg. main packing area with exterior pockets, MSRP \$170, sacrifice at \$70/obo. 626/794-9579. DODGER TICKETS, selected games from seas-on ticket pkg., loge level (orange), aisle 132, inside 1st base, 2 tickets/game at face value \$30 ea., see www.delunac.net/tickets. 626/296-1253. DODGER TICKETS, field level, games include Cubs, Angels and Giants. 365-3350. EXERCISE EQUIPMENT, Alpine climber (like stair climber), \$50. 626/289-2795. FURNITURE: 2-piece Bassett sectional (1 pc. is a sleeper), floral print; one 40" coffee table + two 26" end tables (mission style); photos avail.; all in gd. cond.; \$500/obo; parts could be sold separately. 626/791-6101. FURNITURE: desk, carved oak 50" W x 24" D, 2 matching bookcases, 50" H x 25" W x 12" D, \$500; Techline, office, white, 6 pcs., \$350; rug, Spanish, hand-made, 7' x 9', bright pink & orange, \$200; desk, library, mission, 34" x 24", dark oak, \$375; mirror, framed, tall, wood, \$25; server, mission, oak, 38 W x 20 D x 37 H, \$300; 2-lamps, ceramic, \$30. 626/584-0860, day; 626/794-3144, eve., Donna. FURNITURE: sofa and loveseat, matching, multi-colored, only 4 months old, like new, moved in with roommates and no longer need, \$500/obo. 626/399-3037. FURNITURE: sofa, dual-recliner & loveseat, contemporary with pub-style back and deep stitched contours in soft textured abstract fabric, light color; computer desk, dark brown, sturdy, make offer. 626/799-7593. HEADBOARD/FOOTBOARD, queen, brass with ceramic toppers, exc. cond., \$350; WATER-BED FLOATATION SYSTEM with foundation, Somma queen, \$100. 626/447-6423. LAWN MOWER, Murphy 5 HP 20" gas w/3-in-1 capability to mulch, bag and side discharge, adjustable height, good working cond., \$95/obo. 909/576-5788. LOVESEAT, exc. cond., 5' L, beautiful soft green/blue/pink floral design upholstery, \$75. 626/644-1296. MICROWAVE, Panasonic, white, 1000W, \$40; SCANNER, UMAX 1220P for Windows, \$15; STEREO SYSTEM, Sony LBT-G2000, 3-disc CD changer, \$75; BED FRAME, queen size, \$5. 323/342-9363. MISC: turkey roaster, 15 x 11 x 7 1/2", self basting, vg cond., \$8; cooking kettle, covered, like new, \$7; bun warmer, electric, vg cond., \$7; beverage pitcher, glass, 2 1/2 qt., gold rimmed, etched body, beautiful, \$7; vegetable dish, covered, porcelain w/ handles, rose pattern, \$9. 626/793-1895, Albert. MISC: man's formal tuxedo dinner jacket, 40 long, burgundy color, for weddings, cruises, etc., like new, \$25/obo; bed pillows, new, \$5/ea.; sleeping bag, attractive, inside like new, \$10; tennis shoes, Wilson, sz. 12, like new, \$9. 626/793-1895, Albert. MOVING SALE: ottoman bed, twin size with brown fabric slipcover, hardly used, very good condition, always covered with slipcover, \$150/obo. 909/896-9685. RECLINER, brown leather, swivels, rocks, fully reclines, made in USA by Franklin Corp., very comfortable but rarely used, \$300. 653-8204. SCUBA gear, full set, most is Scuba Pro with DUI dry suit included, www.guiwits.com/scuba for details, \$2,800/obo. steve@guiwits.com. SCULPTURES from Disney movies, "Classic Collection," porcelain, hand painted, boxed, certif. of authenticity, from 4" to 10" H, some 9" long; Beauty & Beast, Snow White w/7 dwarves & hearth (individual), Cruella deVil (hugh), Icabod Crane, Headless Horseman, Pinocchio & characters, beautiful; \$50-\$400. 626/963-2278, Glendora, Karen Hartman. SOFA HIDE-A-BED, queen size, exc. cond., subdued floral pattern, \$980 new, sell for \$485. 626/794-7498. THEATER TICKETS, 2, for Little Shop of Horrors, Ahmanson Theatre, Aug. 26, 8 p.m., seats in mezzanine, \$140. 790-8523. TENTS, Sears Hillary, 9 x 9 ft., fiberglass poles, vg cond., 2 for \$80. 626/797-6982. TOY COTTAGE, Little Tykes, telephone, stove/sink for cooking, 4 shutters/windows, a door, plastic tea sets, pots, dishes, mint condition, always kept indoors, will deliver in Pasadena area, original price \$300, sell for \$175; BIRD CAGES, assorted; DOG HOUSE, med. size, \$30. 249-6248. WASHER, Sears Kenmore, \$50. 626/445-4497.

Vehicles / Accessories

'97 CHEVROLET Suburban LS, V8, 123K mi., driver & passenger airbags, pwr. everything, no accidents, flawless cond., vake3377@yahoo.com for pics, \$14,000/obo. 846-0053.

'93 CHEVROLET Suburban 2500 2x4 350 V8, red, exc. cond., well maintained, low mileage; incl.: a/c, pwr doors/windows, wood trim dash, custom front sheepskin covers, running boards, new tires with Weld wheels, Flow-master exhaust. 626/359-7666. '00 DODGE Durango 4x4 SLT, 43K, 4.7L V8, au-to, overdrive, 7-passenger, red w/tan leather interior; loaded: cruise, tilt, front/ rear air, am/fm/CD/cass., dual airbags, privacy glass, luggage rack, running boards, alloy wheels, ABS, tow pkg., pwr. seat/steering/windows/locks/mirrors, like new inside/out, transferable 8/80 warranty, can send digitals, \$17,500/obo. 661/945-9984. '97 DODGE Grand Caravan, sport package, V6, 71K, white, tan int., factory tint, overhead console, rear air, power locks/doors, security syst., very sharp, e-mail avbattis@yahoo.com for pics, \$7,800/obo. 909/702-2326. '01 FORD F250, super duty, crew cab, V10, 30K mi., 60K warranty, very clean, only used as extra vehicle to tow a boat, must sell, \$23,000/obo. 399-1667. '65 GLASPAR boat, 16 ft. with trailer, 75 HP Evinrude outboard engine, very nice exterior, interior OK, canopy and extra features, great for first time boat buyer, \$1,450. 323/266-8671, Duane. '98 HONDA Accord LX sedan, 58K mi., silver, manual 5-spd., a/c, pwr. windows/doors/locks, new tires, \$8,500. 626/403-7163, Katie. '97 HONDA Valkyrie motorcycle, showroom cond., many extra chrome parts, garage kept, 26K mi., windshield, leather bags, studded seats, purple/white, \$7,900. 957-2852. '93 INFINITI G20, loaded, sunroof, new clutch, 117K, just broken in for this car, great mpg, very nice, e-mail avbattis@yahoo.com for pics, \$3,999/obo. 909/702-2326. '94 ISUZU Trooper LS, 4D, V6, 4WD, 3.2 L, DOHC, automatic, locking hubs, antilock brakes, cruise control, alarm, am/fm stereo, 12-CD player, white, exc. shape, tinted windows, new a/c, new trans'm'n, pwr. steering/windows/locks, tilt wheel, rear window defroster, rear window wiper, exterior spare tire carrier, \$6,495/obo. 957-3296. '00 JEEP Grand Cherokee, only 44,800 mi., 4-dr., a/c, CD, power door, exc. cond., \$13,150/obo. 731-0470. '01 LEXUS RX 300, 2WD SUV, 38K mi., power moonroof, CD changer, leather, exc. cond., \$26,900. 818/395-9631, 562/695-5197. '96 LEXUS SC 300, loaded, leather, power seats, sunroof, 48K miles, rear spoiler, metallic gold color, 12-CD changer, etc., \$12,500. 909/599-3230. '86 MERCEDES-BENZ 560 SEL, dk. blue ext., gray leather seats, 4-dr. sedan, 153K mi., pwr. windows/seats, seat heaters, sunroof, cruise contr., great stereo w/CD, new tires, registration just pd., looks great, \$3,800/obo. 323/442-6533, Candy W or myella76@hotmail.com. '93 MERCURY Villager GS, 7-seat, power steering/windows/doors/locks, a/c, am/fm stereo, good cond., \$3,500/obo. 249-9093. SERVICE RAMPS, automotive; 16" W x 16' L, 21" lift, rear fold-down legs with bridge, very heavy duty, near new, \$850. 909/596-2848. '00 TOYOTA Tundra Ltd., 56K mi., ABS, full power, snug top, carpet kit, tow pkg., 6-CD in dash, new tires, \$16,900. 909/596-9007. '99 TOYOTA Avalon XL, automatic V6, 52K miles, 4-dr. sedan, silver w/tan cloth interior, pwr. steering/seats/doors/window, airbag, ABS, cruise control, am/fm/CD/cass./radio, a/c, alarm, gd. cond., \$10,800/obo. 248-4003. '94 TOYOTA Camry, 4-door, 92,500 mi., 4 cyl., champagne ext./beige int., auto, a/c, cruise control, vg condition, \$2,950/obo. 790-5965. '99 VW Passat, loaded w/sunroof, CD, power all, alloy wheels, heated leather seats, cruise control, tiptronic auto trans, 2nd owner, 72K mi., pics: www.begrific.com/4sale/passat, \$14,500/obo. 323/578-8995, be@begrific.com. '97 VW Passat GLX, V6, sedan, auto, white, sunroof, leather, a/c, 4-wheel disk brakes with ABS, premium sound, 6-CD changer, LoJack and alarm, 62K miles, runs great, \$7,650/obo. 626/794-4592, Dan Barber.

Free

DRYER, needs starting switch from Sears parts store for \$70. 626/445-4497. FENCE MATERIAL, 4 ft., chain link, tension bars, metal pipes in assorted sizes, can be used to construct fence. 249-6248.

Lost & Found

FOUND: several pieces of jewelry at the Woodbury Complex, Building 601 over the past month or so. 4-5640, Jennifer.

Wanted

SPACE INFORMATION/memorabilia from U.S. & other countries, past & present, for personal use. 790-8523, Marc Rayman. VANPOOL RIDERS, from Victor Valley to JPL. 4-1424, Scott. VOLLEYBALL PLAYERS, coed, no beginners please, Tues. nights 8 to 10 p.m. at Eagle Rock High School, \$4/nt. 956-1744, Barbara.

For Rent

ALTADENA furn. rm, 3 mi. from JPL, nice neighborhood, incl. linen, laundry, parking, kitchen, patio; \$500 + sec. dep. 626/798-4821.

LA CANADA, very small rm, separate from house, furn., walking dist. to JPL from horse trail, futon, refrig., microwave, heat, a/c, cable, priv. entrance, security gate, weekly or monthly OK, all util. pd, \$175/wk. 790-1893, leave msg. LA CRESCENTA, 3+2, 2 car, exc. remodeled English style, laundry rm., dining room, nice yards, plum and tangerine trees, fireplace, bricks, slate, charisma, Glendale schools, \$1,995. 248-7610.

PASADENA detached bungalow, 2 bd., 1 ba., all new interiors, hardwood floors, laundry hookups, dishwasher, microwave and oven, granite countertops, private backyd., parking for 1 car, \$1,500/1-yr. lease. 213/952-9052, Allan.

PASADENA home for lease, 2 bd., 2 ba., hardwood floors in living + dining rms., beautiful fireplace w/hardwood mantle, remodeled kitchen, laundry rm., convenient loc. on peaceful tree-lined st., nr PCC/Caltech, Rose Parade route/Metro Gold Line, new paint and carpet, gardener, 76 N. San Marino Ave., \$1,695. 790-3336.

PASADENA, unfurn. 2 bd., 1.5 ba., 2-story townhome-style apt., central a/c, refrig & stove, laundry room, patio, parking; close to Caltech & JPL; \$1,095 + utilities. 626/429-3677 or bettyrs@earthlink.net.

SAN MARINO home for lease, 3 bd., 1.5 ba, walk to Carver Elementary & San Marino High; refrigerator, range, microwave (brand new), newly painted, cent. a/c & heat, alarm system, covered patio, 2-car attached gar.: 1580 Bellwood Rd.; \$3,200 (incl. gardener, trash and water bills). 714/553-8585, Richard Tan. S. PASADENA condo, 2 bd., 2 ba.; end unit; unfurn.; carpets, refrigerator (if needed), stove, dishwasher, balcony, central heat/air, laundry facility, controlled access, gated parking (1 space); walk to downtown S. Pas, near Old Town Pasadena; adjacent to Garfield Park (tennis courts); near 110, 210, 134 & 710 fr-wys; water incl.; cats allowed w/deposit, \$1,650 w/negotiable deposit. 626/441-0231.

Vacation Rentals

BALBOA ISLAND, cute upstairs apt., fully furnished, 2 bd., 1 ba., deck, parking, laundry, steps to bay, sleeps 5; avail. weekly June-Sept. for \$1,000-\$1,500/week. 626/429-3677 or bettyrs@earthlink.net.

BIG BEAR LAKEFRONT luxury townhome, 2 decks, tennis, indoor pool/spa, nr. skiing, beautiful master bd. suite, slps. 6. 949/786-6548. ENCINITAS beach cottage, 2 bd., 1 ba., steps to beach access w/lifeguard, on quiet Neptune Ave., moments from dining spots & downtown, Old Encinitas; awesome tropical front yard w/bi-level decks for BBQ and entertaining; surfing, rollerblading, bike riding along Neptune Ave., avail. June-Sept. 2004 from Saturday to Saturday, \$1,850/week. 760/942-4470.

FLORIDA, New Smyrna Beach, fully furn. condo, 2 bd., 2 ba., full kitchen, half-hour to Cape Canaveral; quiet, relaxing, overlooking beach; BBQ/pool/game rm., great ocean view, easy walk to stores and restaurants; sleeps 6; weekly or monthly. 909/981-7492, Darlene, or dfhaugc@yahoo.com.

MAMMOTH, Snowcreek, 2 bd., 2 ba., + loft, slps. 6-8, fully equip'd kitch. incl. microwave, D/W, cable TV, VCR, phone, balcony w/mtn. vw., Jacz., sauna, streams, fishponds, close to Mammoth Creek, JPL disc'nt. 626/798-9222 or 626/794-0455 or valeriec@caltech.edu.

HAWAII, Maui condo, NW coast, ocean front view, 25 ft. fr. surf, 1 bd. w/loft, compl. furn., phone, color TV, VCR, microwave, d/w, pool, priv. lanai, slps. 4, laundry fac., low season rate \$115/nite/2, high season rate \$130/nite/2, \$15/nite/add'l person. 949/348-8047 or jackandrandy@cox.net.

HAWAII, Maui luxury condo, 2 bd., 2 ba., sleeps 6, fabulous view, 2 pools, tennis court, BBQ, 3 min. walk to beach, Saturday to Saturday only, \$475. 562/597-2977, Sue.

HAWAII, 2-bd. condo in luxury 5-star Kona resort, full kitchen, pool, beach, snorkleing, scuba, golf nearby; available June 5-12, \$950/obo. 248-0871, Cathie.

OCEANSIDE condo, fully furn. 2 bd., 2 ba., fireplace, full kitchen, quiet, relaxing, beautiful beachside setting; BBQ, pool/spa, game rm., grt ocean view; easy walk to pier & res-taurants, slps 8; weekly or monthly. 909/981-7492, Darlene, or dfhaugc@yahoo.com.

OCEANSIDE condo, on the sand, charming, 1 bd., panoramic view, walk to pier & harbor, pool/spa, game room, slps. 4. 949/786-6548.

OCEANSIDE condo, beachfront, lovely 2 bd., 2 ba., single-level, deluxe, fireplace, white water ocean views, end unit, luxurious gated complex on sand w/gm. rms/fitness rm./pools/BBQ's/ Jacuzzi, 10 min. walk to pier/harbor, slps. 6, JPL disc'nt, see www.beachvisitors.com. 760/433-4459.

OCEANSIDE condo, beachfront, beautiful, 1 bd., 1 ba., deluxe, fireplace, garden view, luxurious gated complex on sand w/game rms., fitness rm, pools, BBQs, Jacz., 10 min. walk to pier/harbor, sleeps 4, JPL discount, see www.beachvisitor.com. 760/433-4459.

RESORTS, 5-star; incl. Carmel, Tahoe, Sedona, Colorado Rockies and Florida, luxurious residential-style studios w/turn. kitchenette, starting at \$511 for 7 nts; larger units w/1-3 bd., living rm., full kitch. 626/ 794-9579 or fivestarresorts@earthlink.net.

ROSARITO BEACH condo, 2 bd., 2 ba., ocean view, pool, tennis, short walk to beach on priv. rd., 18-hole golf course 6 mi. away, priv. secure parking. 626/794-3906.

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